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Original Article

Dissemination of carbapenem-resistant *Acinetobacter baumannii* in patients with burn injuries

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Abstract

Background: Carbapenem-resistant *Acinetobacter baumannii* has emerged as an important cause of infection in burn patients. This study aimed to characterize the antimicrobial susceptibility pattern, determine the prevalence of oxacillinase and metallo-beta-lactamase (MBL) genes, and type the *A. baumannii* isolates obtained from burn patients.

Methods: During a 1-year period, a total of 40 nonduplicated isolates of *A. baumannii* were obtained from burn patients who were hospitalized in the Taleghani Burn Hospital in Ahvaz, in the southwest of Iran. Testing for antimicrobial susceptibility was carried out by disk diffusion and E-test. To screen MBL production, a double disk synergy and MBL E-test were performed. The presence of $bla_{\text{OXA-23-like}}$, $bla_{\text{OXA-24-like}}$, $bla_{\text{OXA-51-like}}$ and $bla_{\text{OXA-58-like}}$, bla_{VIM}, bla_{IMP} and bla_{SPM}, and bla_{NDM} was sought by polymerase chain reaction (PCR). Repetitive extragenic palindromic sequence-based PCR was carried out for determination of isolates clonality.

Results: Overall, 92.5% of isolates were carbapenem-resistant. Polymyxin B, colistin, and ampicillin-sulbactam were the most effective agents *in vitro*, with a susceptibility rate of 100%, 97.5%, and 72.5%, respectively. According to the double disk synergy and E-test, 55.6% and 97.3% of isolates were MBL producers, respectively. Furthermore, 70% of isolates harbored $bla_{\text{OXA-23-like}}$ and 20% were positive for $bla_{\text{OXA-24-like}}$. However, no encoding genes were detected for bla_{VIM}, bla_{IMP} and bla_{SPM}, bla_{NDM}, and $bla_{\text{OXA-58-like}}$. Repetitive extragenic palindromic sequence-based PCR revealed that carbapenem-resistant isolates belonged to four clones, including A, B, C, and D; the predominant clones were B and C.

Conclusion: The rate of carbapenem resistance was high, and it appeared that $bla_{\text{OXA-23-like}}$ and $bla_{\text{OXA-24-like}}$ contributed to the carbapenem resistance of *A. baumannii* isolates. This result suggests that the two predominant clones of *A. baumannii* were spread among burn patients. In order to prevent future dissemination of resistant isolates among burn patients, an effective infection control plan is necessary.

Keywords: Acinetobacter baumannii; burns; carbapenem- resistant

Conflicts of interest: The authors declare that they have no conflicts of interest related to the subject matter or materials discussed in this article.

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